Idaho Carbon Sequestration Advisory Committee
January 25, 2004

Attendees: Jerry Nicolescu (Chair rep.)

Welcome by Jerry Nicoescu. Requested Morgan Evens be excused. Time turned to Tony Bennett purpose is to discuss carbon sequestration and carry out the charter requirements.

Introductions.

Big Sky regional Partnership phase II Update
Presented by Susan Capalbo, BSRCSP Director

DOE Carbon program- included Core R&D, Infrastructure and Integration.

Phase II implantation of phase I. Discuss: Criteria for successful technologies for Sequestration carbon - Effective & cost competitive, provide long term storage and environmentally safe and have public approval. Discuss: challenges of carbon sequestration - Cost global not regional issues, absence of voluntary reduction connecting the issue to the public. Ex: British airlines charging $2 for emissions from flight – less than .5% of consumers willing to pay. Argue is this current: yes. People willing to talk but not pay for environmental concerns.

Partnership region. Overview of partnership goals. List of partners. Partner contributions and benefits. Include Nez Perez in institutions with the universities and INEEL.

Big Sky carbon sequestration management plan
Flow chart of management /administrative structure and technical leads
    For more details on management structure see Susan.
Big Sky Partnership Region Contains substantial energy resources. This used to sell idea to INL for more funding.

Phase 1 results: shown in maps and data. For geo & terrestrial.
Geological Sequestration potential:
    Identify sources
    Demo projects
    Transfer results to nation.

Basalt provinces & power plants. Will be covered by Bob after break.
Columbia River basin. Sequestration example & flood basalts
Conclusion: Sequestration of Basalts

Terrestrial Sequestration Efforts
    Pilots and activities.
Forestry Sequestration potential
Agriculture land estimates in big sky area.
Rangeland potential: By state.
Carbon Markets
    Phase II markets
Economic/Risk assessment

Explanation of why it's important.
Regional energy growth analysis & population growth.
Energy transmission infrastructure.
Water availability implications.
Constraints

Regional energy analysis for Phase II
Phase II outreach and education: Activities.

Big Sky collaboration with Sempra Generation.
Involvement and desired outcomes of the partnership.

Susan will leave PowerPoint presentation for committee members

Carbon Mitigation for CO2
Presented by Bruce McCulloch, Sempra Generation

Carbon Sequestration: from one customers' perspective.
Sempra Generation Project Portfolio

Why Coal in the Pacific N.W.
Already in use.
Market needs for the future:
Utility requirements needed by 2015
This project is for ID & NW not California
Where will this come from?
Wind, solar, geothermal, Hydro, Nuclear, Natural gas, Coal? Each discussed.
Fuel price: Natural gas vs. coal: Gas prices tripled in last 5 years.
Coal vs. Gas fired power: coal again.
Potential site for Idaho Valley Energy plant and disposal site 9 miles outside Jerome 3 miles from Midpoint Substation.
Project description:
Fuel: consumption 1.7 to 2.5 MM tons/yr. 3 to 4 trains per week
Ash & Gypsum: produces 150000 tons of ash/yr. sulfur produces 75000 tons/yr of gypsum. They will be sold or disposed onsite.
Improved technology: supercritical technology – more energy efficient – less fuel & emissions

- selective catalytic reduction – 90% nitrogen oxide reduction
- baghouse filters
- Wet scrubber
- Multi-emissions 70% reduction in mercury
- MISSED last point

Emissions of sulfur dioxide & nitrogen oxides from coal plants

Permitting and Public Involvement
2 year permitting cycle.

Water usage 7000 acre feet/year. Will apply for water rights currently being used by currently land owners using land for farming & ranching.

GHG Emissions.

Big Sky & Sempra Generations: advantages of partnership for both parties.

Sempra's role in Big Sky Partnership:
- Close collaboration wit NCOC
- Active partnership in design and implementation
- Principle market activity
- Focus on opportunities in ID, MT & WY

Idaho Valley - GHG reduction Opportunities
- Super critical cycle steam provides 10% efficiency improvement
- SCR reduces NOx
- Sale of fly ash will displace cement production which reduces CO2 emissions by 1T/ton/yr.

Why ethanol in Idaho?
- Good agriculture base
- Low pressure steam from plant offers low cost of energy & reduction of CO2 production
- Geological Sequestration
- Sempra initiated a study of ethanol
- Big Sky Partnership to evaluate CO2 sequestration

Summary:
- Project will meet growing demand in ID & N.W. states
- Project adopts latest commercially proven technology
- County, State & Federal agencies ensure compliance w/ regulations.
- Significant GHG reduction opportunities.

Sempra has not yet purchased carbon credits and will not until they can offset the cost with consumers. If they became an environmental advocate it would have to be voluntary.

Carbon Sequestration – Geologic activities in ID
Presented by Bob Smith, University of ID

Big Sky Carbon Sequestration Partnership Phase II Basalt Sequestration

Just evaluating the current carbon sequestration & things that make since in the region. .

Geological sequestration
- Emphasis is on major regional geological structures that have potentional for CO2 emissions abatement from future coal-based power production.
- Projects focus on reservoirs that are chemically reactive w/ CO2 in addition to normal hydrodynamic & solubility

Mineral Trapping: Study of different rocks and types of sediment with CO2 buried in it.

Rational for Basalts:

- Major flood basalt formations exist throughout the world.
- Over 30 years & >$400M of prior DOE spending & study of rocks.
- Capacity & retention – Columbia River Basalt Group & Snake River Basin covers lots of mass & chemical makeup favorable
- Water resource implications

Layered Basalt Flows

Transmissivity of Basalt Aquifer System.

- Shallow basalts
- Proven connectivity

National Mafic Rock Atlas

- Develop a GIS-based tool the integrates
- Provides for transferability of results nationally and internationally

Generalized Mineralization Scheme – Ask Bob for copy.

Reaction Products – (models not actual tests show) CO2 turns from gas to solid in aprox. 300-400 yrs.

Porosity Changes – changes from aprox. 14% to 10%, lowers the mineral precipitation from 0% to aprox -10%

Trapping process – over 400 yrs shown. Ask bob for copy of graphs for more info.

Basalt Field Pilot –

- 3000MT of co2
- Utilize existing deep well infrastructure to minimize drilling
- Target is Grand Ronde Basalt (1100 m depth)
- Post injection core sampling
- Validate supercomputer simulations of co2 dispersion, dissolution and trapping in basalt using suite of geophysical hydrologic and tracer methods.

Q. Temp at that depth? A. aprox. 110 degrees

Q. How will added material affect the geothermal activity and temp of region?

A. Don't know yet. That modeling will be done but not yet completed.

Q. Where does material go that is displaced when co2 is buried?

A. Don't know yet. Phase II will answer these questions better.

Q. Economic considerations?

A. Susan addressed this and the partnership is continuing to address this.

- Can not put a full dollar amount on this until phase II is complete.

Supercritical CO2 pressure cell - Experiments w/ Columbia River Basalt

- Long-term experiments showing transition from calcite to ankerite, Ca (Fe, Mg, Mn) CO3, 2

Supercomputer simulation of CO2 Injection in Grand Ronde Basalt.

- Simulations show that because of the nature of basalt the CO2 moves sideways with little upward motion. Need to complete Phase II to confirm simulations and find out if gasses will continue to progress towards the surface or if it will cap off.

Pacific N.W. Direct Seed Association Agriculture Carbon Trading Experience
Presented by Dick Wittman, PNWDSA
See attached printout of PowerPoint for more info.

PNDSA experiences as an aggregator- Carbon Credit Leasing

Dick's Background

Focus of Today's presentation – History & why we got involved

PNWDSA Formation
- PNWDSA is an information exchange organization.
- PNWDSA's makeup

Key event that drove carbon trading market development.
- Environmental Defense – ED

(slide missing from printout)
Reduced CO2 emissions from carbon sequestration.
- Co2 emissions from beneath
- 3.7 tons of co2 is released w/ every ton of carbon in the earth that is lost
- Kyoto talks estimated that we need 620 million tons to meet Kyoto.

Published informational document for membership can be printed from website.
Questions listed on FAQ's include
- 10 questions… some being
- What is carbon sequestration?
- What is the unit that is traded?
  - Carbon sequestration credit-rmu
  - Emission reduction unit erc.
- How much can be sequestered from direct seeding?
- How is sequestration measured?
- Who are potential buyers?

Why Lease vs. Sale?

Soil Carbon Sequestration: A working contract

What the PNDSA desired:

What Entergy wanted:

The Process: 8 points

Core Eligibility Requirements.

What we negotiated.

PNDSA aggregator contract w/ farmers. – contract details pg 22. wanted to make the contract good for everyone involved. Those who had been in the practice for many years and those just starting. Money not as important as doing something healthy for the environment.

New Contract Proposal – ED. ED is setting the goals high, with increased potential acreage and pay. Higher values for RMU's and vary the compensation for rainfall and rotation.

Next Steps.

Q&A
Q. If someone is in pasture or hay or grass, can they join?
A. Yes. They take anyone. Can clear a pasture with DS.
Q. On next round if some one has 5000 acres can they participate
A. Yes. There is no minimum just a maximum. Some farmers lease, land owners can stipulate what type of farming they allow on their land
Q. How do you justify having land that has been a sink and is now a source?
A. Works on a cycle. Look at the big picture. Leasing for a period time. Not sure how long until you meet saturation. That's why they promote leasing instead of buying.

We can take a lot of our resources and develop them and then take them to other

PNDSA.org

Agriculture Subcommittee Report
Tony Bennett – Subcommittee Chairman

Trying to follow up with the mandates required by legislation.
Have a current piece of legislation before the senate. It includes funding for committee
Have meet w/ 5 senators discuss what they wanted. Their recommendations are listed. Are trying to follow through with the information and duties requested.
Next meeting time is not yet set.

Forestry Subcommittee Report
Tiny Furhman – Subcommittee chairman

Forestry Report done but trying to find sources. Trying to contact Charlie McHammon. No return contact. Will try to get new economist from U of I. Paul will talk to dean about him. Weighing options.
Brian updated committee on projects with Sempra, not really sure where they are at.

Alternative Fuels Subcommittee Report
Paul Mann – Subcommittee chairman

Gave a history and background on bio-fuels and ethanol.
Plants ran until 90's and then closed. The clean air act also boosted the usage and info about ethanol. But still difficult to market it. EPAC in 1992 boosted ethanol also.
Discussed benefits of using bio-fuels. Farm Bureau introduced a bill to legislature that mandates 10% conversion to ethanol. Talked about MN's changes and bills passed. Last years bill was dropped. This years bill addresses the necessary concerns and advocates the opening of plants in

Idaho and promote the sale of bio-fuel but not bio-diesel. We have the capacity why aren't the plants opening? Political and/or economic issues and interference. There are local groups wanting to open plants now. Hopefully they will be able to open. Paul will get the name of the group. Would expensive changes be needed to alter cars for ethanol use. No, not major changes. What about hydrogen cells, do we know anything about them? No.

National Carbon Offset Coalition Overview
Ted Dodge – NCOC
Neil Sampson - Technical Advisor

Briefly discussed today. Will cover in depth tomorrow.
NCOC is heavily influenced by the Chicago Climate Exchange
Started a program for easy exchange of carbon credits, they are piloting a program in ID.
DOE is coming out with a design criteria and pilots.
Everything tied to design criteria.
Measuring and tying the carbon rates from this project. Hopefully to have enough data to build a standards basis for the federal gov'n to stand behind.
MSU and Los Alamos Nat'l Lab working on measuring techniques and accuracy of comet model.

Is it cost effective to do critical measuring and if so what is the most cost efficient way?
To find this out…

1. Proposal to measure benchmark farms
2. Get 2O measurements
3. Get ID comet friendly
4. Working with Chicago Climate Exchange

Object to

1. fill in gaps
2. create a region that is bigger than the big sky partnership. State governors involved. Not wait for someone else to create the laws we will have to follow. Create the region that makes the laws.

Don't worry about money right now still to early. Need pilots in ID, that is why they are here.

www.ncoc.us get more info at website.

Neil – background in ID farming and forestry
Tried to provide a low buy in for individuals
Initial proposal short. Can sit and read the short proposal. Take estimate and go fishing for a buyer. Lots of uncertainties.
Did not want to set NCOC standards for individuals. Tried to make the registries easy for users.
Tried to make 1605 easy to understand and make it an easy process to expand. So when they work in the pilots they can be scaled up easily. Such as portfolio standards, the ones they are willing to use with Phase II.
Q.As a producer who is the most credible authority who can give an overview of global carbon trading?
A. Not sure there is one. Worked with many and not sure. The international trading is going one way and the US is going another.

Problems are not technical. They are institutional. If we can overcome the institutional issues the few technical will solve them.
We don’t have the will, we don’t have the political leadership and we don’t have the economic funding to do anything. But we do have the knowledge.

Adjourn. 4:30 p.m.

Idaho Carbon Sequestration Advisory Committee
January 26, 2004

Carbon Sequestration Workshop

Thursday 8:10 am Introductions

Phase II Carbon Market Development
Presented by Ted Dodge, ISCC

19 to 20 attendees sign sheet passed around

Develop a pilot program and road test a strategy, need farmers to test all aspects
Located in Butte, MT RCDs and SCDs, funded by MT, USDA, EPA, going for nine years
National portfolio from NPT 6K acres.
Grant Funds for next 3 yrs provide:
- Handbook functionality
- Planning forms access & use
- Listing agreements and contract functionality market concerns and fed and state carbon registries
- Portfolio functionality, maintenance & marketing issues.
- Implementation timelines and saff responsibilities
- Project measuring monitoring verification implementation and reporting criteria
- Financial feasibility

In next 3 yrs, need to accomplish NCOC & DOE
- (2) 12500 ton portifolio
- Carbon sequestration strategy for Sempra & 25000 metric tons of credit

Gave organizational chart for NCOC.

Strategy for selling carbon credits has been done before with acid rain credits in the 80's This is what the US offered and brought to Kyoto.

Major green house gases CO2, CH4, N2O.
Not sure is N2O is going to be an issue in the future. It is not at this time in our part of the country.

What is Carbon sequestration? Capture and storage of CO2 & other gases.
- Capture can occur
  - At point of emission
  - When absored in air
- Storage location include
  - Underground reservoirs
  - Dissolved in ocean
  - Converted in solid material
  - Trees, grasses, soils or algae

NCOC's carbon credit - Get this from Ted.

1. The quanity of carbon offered in a trade for ex. The amount claimed
2.
3. Equal to one metric ton of atmospheric co2 reistered reduced or avoided from a agreed baseline amount To create a csu the amount of co2 must

Listed terrestrial practices that sequester carbon.

Need land use categories

Reforestation
Afforestation
Agroforestry
Fire rehabilitation
Cropland
Cropland pilot will have 3 key interrelated dimensions resulting in geographically constrained testing

Sequestration Potentional Big Sky region

NCOC combines

Science, policy and market nation wide.

Science:

includes DOE partnerships with universities and national research labs.
Designing standarda & protocols to meet emerging markets & 1605B requirements
7 regional areas & partners listed.
Will test it out over next 4 years. Est. $7 billion in spending in 4 yrs.

Policy:

rules and guidelines for 1605B registry
Providing public comment
Developing climate trust
Reviewing state registries
Developing standards and protocols
Computer model for 'Voluntary Reporting Carbon Management Tool': is available in some states and are trying to make it usable in our region and other places. Used to get accurate number to make a standard that is federally backed.

Market:

NCOC entered into agreements w/2 of 3 largest marketing firms.
NatSourse N.Y. & Chicago Climate Exchange

Process outline for NCOC Portfolio Sale Reviewed.

Negotiations
Preliminary sale
NCOC provides buyer w/ Certificate of Assurance w/ measurement conditions commitments & meet buyer demands
Sale is final. Payment made to NCOC and then distributed.

NCOC website:

Review of NCOC Carbon Sequestration Handbook
NCOC Portfolio Standards
Initial Proposals listed.

NCOC Portfolio Standards and Planning Criteria
Presented by Neil Sampson, Technical Advisor

Reviewed the existing projects with the Nez Perez. Numbers attached.

Access the NCOC website to get accurate paperwork and download up to date information register with the NCOC website they will send you a notice everytime they change the handbook and forms. Get the Carbon Sequestration Handbook, Carbon Sequestration Portfolio Standards & many more.
This version of the Carbon Sequestration Portfolio Standards updated last in 12/2005. will continue to update the info as it comes.

Goals:

1. Provide onterim guidance to project developers and potential buyers for the Big Sky Partnership
2. Develop methods that work for landowners, buyers and NCOC
3. Test & improve
4. Establish basis for national program.

Eligible projects

1. Agriculture
2. Agroforestry
3. Forestry
4. Special projects:
    a. Mined Land Restoration
    b. Biomass Utilization

NCOC is trying to do something that can be used here and expanded to a national level.

Project Requirements

1. Landowner desire (or leasee – who eversign the contract)
2. Initial proposal for project – downloadable from website – easy to use
3. Listing Agreement w/ NCOC
4. NCOC builds portfolio/seeks buyer
5. Buyer makes offer. They will do everything to accommodate the buyer.
6. NCOC and Landowner accept offer. Buyer demands will be negotiated w/ seller.
7. Project plan completed.
8. Contract completed. Will be given to those who want to work with them.

Note:

1. We are experimenting with the sale of environmental values in addition to commodities
2. This is a willing buyer – willing seller market deal if it goes through.
3. Money will be modest. NCOC is dedicated to keeping the costs modest.

Plan requirement

1. Written assisted by qualified professional
    a. peer reviewed by expert consultants
2. Legal agreement transferring CSU' s to NCOC
    a. listing agreement
    b. legal access for monitoring and verification
3. Effective implementation of plan (monitoring)
    a. Annual reporting by landowner
    b. Monitoring by local organization
4. Independent 3rd party verification (periodic)
    a. ANSI-RAB (reference NCOC material) increases credibility

Measuring & monitoring

1. USDA Technical Guidelines used in the national DOE 1604(b) voluntary greenhouse gas reporting guidelines
2. These are due to become official in mid-2006
3. If we can match them w/ our projects the carbon sequestration amounts will be officially recognized.

A. Argiculture
    a. COMET – www.cometvr.colostate.edu
    Estimates annual carbon sequestration for the coming 10 yrs
    b. Available for variety of management systems

B. Direct samples
    a. Sampling design
    b.

C. Forestry
    a. Normal wood measurement techniques

D. Agroforestry
    a. Both wood and soil

E. Biomass Plantations
    a. Onsite biomass is average biomass over 2 rotations
    b. Field monitoring not necessary as can use harvest data

F. Biomass Utilization
    a. Credit for fossil carbon emissions avoided

Reviewed COMET –
Voluntary Reporting of Carbon Management Tool – VR

Start filling in blanks. Enter info. Be careful on the screen requesting amount of land in arces. Enter info in English and multiply by .9 to get the amount of CSU's. Enter info and go to 'get carbon'. Results are not accurate and not suited to the N.W. area of the US. USDA is trying to revamp the system so it will fit ID & N.W. states. When system shows a -9,999.00 the system is saying it really has no clue if this is accurate because they don't have enough data to give an accurate answer.

Soil carbon is like the water in your pond. Soil carbon is a combination of what is coming in and what is going out. As long as input and output remain similar the natural level will remain constant. However if the in/output is changed for ex: due to tilling: the amount of carbon in the soil will greatly diminish.

Q's How do various farming & ranching practices effect carbon levels?
Answers discussed. Unable to do full carbon testing on all test sites. California registry requires that in 4years you must test all green house gases on test sites. Unable to work with Cal because of it.

Q. How do the #'s compare from range or CRP grasses to non-CRP?
A. Not sure as no non-CRP grasses listed on site, however good grazing practices shown to improve carbon over time.
Missed last question, it was about the percentages of carbon in air vs. land in certain environments.

Showed and explained charts for soil carbon calculator in study groups. Neil answered questions on charts. All of it was over my head.

Q. No one is buying wood carbon offset.
A. Currently no one in the market to buy carbon, especially in wood products which become anything and is not trackable after it leaves the harvest spot. Credit for the carbon in use was to be credited to the

Q. Are we really taking the carbon out of the atmosphere?
A. Yes, in a 10 year cycle. But most of the changes will take lots of time… Right now probably not much change but we need to do this for the long term. But there is no such thing as for sure. There is not accurate answer for long term right now. None of solutions last for ever.

Reviewed the project proposal form.

They are not in a position to do projects in this area right now because COMET only able to give a basic county average. They would like to do more.

Will rewrite project proposal form and have it ready for ID this week. They want people to participate in pilot program, offered info on how to do that. System

Q. how far can you reach back for to do a project?
A. depends for trees or soil. Nez perez has trees dating back 15 yrs. But soil data only goes back aprox. 10 yrs. Current projects they only want to do for 5 yrs. But if federal

Q. PNWDSA said leasing instead of buying, you want to buy? Explain difference.
A. PNWDSA is leasing for only 10 years. NCOC is buying rights for only 10 yrs. Because old projects and contracts were for 80-100 yrs. These are short term.

Q. What advice do you have for individuals to protect them from those who are taking advantage of people uneducated in carbon trading? (Snake oil sellers)
A. Try to educate people. Increase our own understanding of issues and increase our information then spread info to others to increase awareness. Try to manage expectations, know this is only in pilot stage and still need more info. Trying to explain to producers that this is not real yet.

Explained second form of project proposal, used Nez Perez as example.

Still not getting paid much but everyone receiving only 1%. If interested in following through with a proposal, access website or contact Ted or Neil.

Adjourn. 11:32 a.m.